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DR-373  
November 1968

AD

AD 844659

METEOROLOGICAL DATA REPORT

NIKE-HYDAC 9.5-68-4-604  
(17 October 1968)

BY

HAROLD M. RICHART

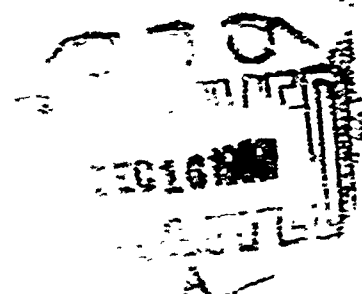
AND

LEN E. CARTER

ATMOSPHERIC SCIENCES RESEARCH OFFICE  
WHITE SANDS MISSILE RANGE, NEW MEXICO

ECOM

UNITED STATES ARMY ELECTRONICS COMMAND



METEOROLOGICAL DATA REPORT

NIKE-HYDAC 9.5-68-4-604  
(17 October 1968)

By

Harold M. Richart

And

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DR-373

November 1968

DA Task 1T665702D127-02

ATMOSPHERIC SCIENCES RESEARCH OFFICE  
WHITE SANDS MISSILE RANGE, NEW MEXICO

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#### ABSTRACT

Meteorological data gathered for the launching of Nike-Hydac 9.4-68-4-604 are presented for the Defense Atomic Support Agency, Sub-task 905, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

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## INTRODUCTION

Nike-Hydac 9.5-68-4-604 was launched from Launch Complex 33, X-361, White Sands Missile Range (WSMR), New Mexico, at 1530 hours MDT, 17 October 1968.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Technical Area, Atmospheric Sciences Research Office, WSMR, New Mexico. The Ballistics Meteorologists for this firing were Harold M. Richart and Len E. Carter.

## DISCUSSION

Wind data for the first 216 feet above the surface were obtained from a system composed of five Aerovanes mounted on a 200-foot tower and cabled to component indicators.

From 216 to 4,000 feet above the surface, wind data were obtained from T-9 Radar-tracked balloon ascents.

Temperature, pressure, and humidity data, along with upper wind data from 4,000 to 100,000 feet above the surface, were obtained from standard rawinsonde observations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Theoretical rocket performance values and ballistic factors as a function of altitude were provided by Atmospheric Sciences Research Office and are the basis for data appearing in Table I.

PAYLOAD		400	Pounds
CORIOLIS DISPLACEMENT	WEST	2.5	Miles
SECOND-STAGE IGNITION	TIME	20.2	Seconds
	ALTITUDE	35,040	Feet MSL
PEAK	TIME	185	Seconds
	ALTITUDE	438,259	Feet MSL
UNIT WIND EFFECT	HEAD	1.7053	Miles/MPH
	CROSS	1.7707	Miles/MPH
	TAIL	1.7053	Miles/MPH
TOWER TILT EFFECT		8.77	Miles/Degree

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES  
NIKE-HYDAC 9.5-68-4-604

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS	LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS	LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
11-60	.1617	800-1000	.0325	15000-20000	-.0096
60-108	.0960	1000-1400	.0516	20000-25000	-.0068
108-148	.0639	14000-2000	.0503	25000-31040	-.0069
148-184	.0535	2000-2500	.0276	31040-36000	.1055
184-216	.0377	2500-3000	.0178	36000-41000	.0321
216-300	.0792	3000-3500	.0057	41000-46000	.0126
300-400	.0666	3500-4130	.0040	46000-51000	.0078
400-600	.0752	4130-10000	-.0135	51000-56000	.0067
600-800	.0542	10000-15000	-.0106	56000-64400	.0053

TABLE II. BALLISTIC FACTORS  
NIKE-HYDAC 9.5-68-4-604



AERO-VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR									
	1 1330 MDT		2 1400 MDT		3 1430 MDT		4 1445 MDT		5 1500 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1	6.0N	5.0E	8.0N	0.0	5.0N	5.0E	6.0N	2.0E	3.0N	4.0E
2	6.0	5.0	8.0	0.0	5.0	6.0	6.0	2.0	4.0	6.0
3	6.0	5.0	8.0	2.0E	7.0	7.0	10.0	2.0	4.0	4.0
4	6.0	5.0	9.0	2.0	5.0	8.0	6.0	0.0	4.0	6.0
5	6.0	5.0	9.0	2.0	8.0	8.0	6.0	0.0	4.0	6.0

AERO-VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR									
	6 1510 MDT		7 1520 MDT		8 1531 MDT					
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1	2.0N	4.0E	2.0N	0.0	5.0N	0.0				
2	2.0	6.0	3.0	2.0E	4.0	1.0E				
3	3.0	5.0	4.0	4.0	4.0	2.0				
4	2.0	4.0	4.0	4.0	5.0	1.0				
5	2.0	4.0	4.0	4.0	5.0	1.0				

TABLE III. ANEMOMETER WIND SPEED AND DIRECTION  
NIKE-HYDAC 9.5-68-4-604

\* Heights corresponding to Aerovane Numbers: 1 = 35 Feet 3 = 128 Feet 5 = 200 Feet  
2 = 88 Feet 4 = 168 Feet

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR									
	1		2		3		4		5	
	1330 MDT		1400 MDT		1430 MDT		1445 MDT		1500 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	3.5N	2.5E	4.0N	1.0E	8.0N	5.0E	5.5N	1.0E	4.0N	5.5E
300- 400	4.0	3.0	4.5	0.0	7.5	4.5	5.0	3.5	4.0	5.0
400- 600	4.5	3.0	5.0	1.5E	7.5	3.5	3.0	5.5	4.0	4.5
600- 800	4.0	2.5	5.0	2.5	8.5	2.0	2.5	5.0	4.0	4.0
800-1000	6.5	3.0	3.0	1.5	9.0	1.0W	1.0	6.5	6.0	4.0
1000-1400	5.5	3.0	3.5	0.5W	10.0	0.5	6.5	6.0	5.0	3.5
1400-2000	5.5	3.0	5.0	1.5E	9.0	1.0	9.5	1.0	4.0	3.0
2000-2500	4.0	2.5	4.5	0.0	8.5	1.5	5.5	4.5	7.0	3.5
2500-3000	4.5	1.5	1.0	2.0E	8.0	1.5	6.0	2.5	8.5	1.5
3000-3500	4.5	0.0	0.5S	3.5	5.5	1.5	5.5	4.0	8.5	2.0W
3500-4000	2.5	1.5W	0.5N	1.0	6.5	4.0	4.5	7.0	6.0	3.5

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA  
NIKE-HYDAC 9.5-68-4-604

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR									
	6		7		8					
	1510 MDT		1520 MDT		1531 MDT					
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	2.0N	4.0E	4.0N	4.0E	5.0N	2.0E				
300- 400	4.5	2.5	4.0	5.5	6.0	4.5				
400- 600	7.0	3.5	4.5	6.5	9.0	4.0				
600- 800	7.0	1.0	3.5	7.0	6.0	4.0				
800-1000	4.5	5.5	4.0	6.0	3.0	3.5				
1000-1400	5.0	5.0	3.0	6.5	2.0	3.0				
1400-2000	8.0	2.0	6.0	6.5	5.0	2.0				
2000-2500	11.5	2.0	10.0	4.5	5.0	0.5W				
2500-3000	8.5	0.5	11.0	1.5	6.0	1.0				
3000-3500	3.5	0.0	9.0	1.0W	5.5	2.0				
3500-4000	2.5	0.5W	6.0	6.0	4.5	1.0				

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA (CONT)  
NKK-HYDAG 9,5-65-4-604

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS					
	1 1230 MDT		2 1500 MDT			
	N-S	E-W	N-S	E-W	N-E	E-W
4130-10000	4.5N	12.0W	2.5N	14.0W		
10000-15000	3.5	20.5	0.5	14.5		
15000-20000	5.0	28.5	5.0	29.5		
20000-25000	13.0	35.5	31.0	36.5		
25000-31040	13.5	36.5	20.5	35.5		
31040-36000	29.0	34.5	36.5	31.0		
36000-41000	14.5	39.5	7.0	40.5		
41000-46000	19.0	33.0	12.5	35.0		
46000-51000	0.0	30.0	0.0	33.0		
51000-56000	3.58	18.5	0.0	28.0		
56000-64400	5.5	9.5	0.0	15.0		

TABLE V. RAWINSONDE-MEASURED WIND DATA.  
NIKS-HYDAC 9.4-68-4-604

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 848

SIGNIFICANT LEVEL DATA  
0731003902  
WHITL SANDS SITE

WSTM SITE COORDINATES  
400500.000000  
105045.000000

TABLE VI

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MSL FEET	TEMPERATURE		REL. HUM. PERCENT
		AIR DEGREES	DEWPOINT CENTIGRADE	
882.1	3989.0	17.3	-0.8	16.0
877.0	4309.5	14.4	-9.0	19.0
811.0	6296.6	8.4	-11.0	24.0
750.0	8076.2	3.1	-19.1	29.0
693.0	10499.9	4.0	-18.2	18.0
659.0	11040.1	3.0	-20.4	16.0
684.0	19809.2	-13.0	-29.9	23.0
342.0	27509.4	-31.3	-47.0	20.0
331.0	28930.9	-34.5	-49.8	22.0
281.0	32615.5	-44.0	0.	**
252.0	35017.2	-45.0	0.	**
206.0	39402.8	-50.1	0.	**
201.0	39932.3	-49.6	0.	**
195.0	40580.7	-53.2	0.	**
172.0	43236.8	-54.5	0.	**
134.0	48398.7	-63.4	0.	**
118.0	50983.0	-62.0	0.	**
107.0	52955.3	-67.0	0.	**
104.0	53524.6	-64.9	0.	**
102.0	53913.0	-67.4	0.	**
84.0	57791.7	-64.4	0.	**
82.0	58279.6	-62.0	0.	**
77.0	59563.7	-62.0	0.	**
69.0	61625.3	-57.8	0.	**
43.0	71716.5	-55.9	0.	**
30.0	79368.4	-51.2	0.	**
27.0	81631.9	-51.5	0.	**
11.0	101314.2	-42.3	0.	**
9.4	104352.0	-44.2	0.	**
8.8	106299.7	-41.0	0.	**

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

NOT REPRODUCIBLE



NOT REPRODUCIBLE

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 848

UPPER AIR DATA  
0731003902  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00 FEET E  
185045.00 FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			DIRECTION DEGREES (TN)	SPEED KNOTS			
18500.0	509.2	-10.4	-28.2	21.9	674.8	631.3	30.6	282.9	30.6	1.000154
19000.0	489.4	-11.4	-28.8	22.3	654.4	630.1	31.4	283.7	31.4	1.000151
19500.0	489.8	-12.4	-29.5	22.7	654.2	628.9	32.3	283.5	32.3	1.000149
20000.0	480.2	-13.5	-30.3	22.9	644.0	627.6	33.2	283.5	33.2	1.000146
20500.0	470.4	-14.6	-31.4	22.7	633.7	626.2	34.2	284.4	34.2	1.000144
21000.0	460.7	-15.8	-32.5	22.5	623.6	624.7	35.3	285.6	35.3	1.000141
21500.0	451.3	-17.0	-33.6	22.3	613.7	623.3	36.2	287.9	36.2	1.000139
22000.0	442.1	-18.2	-34.7	22.1	604.0	621.8	37.2	290.4	37.2	1.000136
22500.0	433.0	-19.4	-35.9	22.0	594.4	620.3	38.8	293.7	38.8	1.000134
23000.0	424.2	-20.6	-37.0	21.8	585.0	618.9	40.2	296.6	40.2	1.000132
23500.0	415.5	-21.8	-38.1	21.6	575.8	617.4	40.7	298.2	40.7	1.000130
24000.0	407.0	-23.0	-39.2	21.4	566.7	616.0	41.2	298.7	41.2	1.000127
24500.0	398.7	-24.1	-40.3	21.2	557.7	614.5	41.6	297.3	41.6	1.000125
25000.0	390.5	-25.3	-41.4	21.0	548.9	613.0	42.5	294.9	42.5	1.000123
25500.0	382.5	-26.5	-42.5	20.8	540.3	611.5	43.7	292.1	43.7	1.000121
26000.0	374.7	-27.7	-43.6	20.6	531.8	610.1	42.6	290.2	42.6	1.000119
26500.0	367.0	-28.9	-44.7	20.4	523.5	608.6	41.4	288.7	41.4	1.000117
27000.0	359.5	-30.1	-45.8	20.2	515.3	607.1	40.0	288.6	40.0	1.000115
27500.0	352.1	-31.3	-46.9	20.0	507.2	605.6	38.4	288.9	38.4	1.000114
28000.0	344.6	-32.7	-47.9	20.7	499.4	603.8	36.3	289.7	36.3	1.000112
28500.0	337.2	-34.2	-48.9	21.4	491.7	601.9	35.7	290.4	35.7	1.000110
29000.0	330.0	-35.7	-50.1	21.6**	484.1	600.1	36.2	291.1	36.2	1.000108
29500.0	322.7	-36.8	-52.3	18.6**	475.8	598.6	37.3	291.0	37.3	1.000106
30000.0	315.6	-38.0	-54.8	15.6**	467.6	597.2	38.7	290.7	38.7	1.000104
30500.0	308.7	-39.1	-57.4	12.6**	459.6	595.7	39.5	289.7	39.5	1.000103
31000.0	301.9	-40.3	-60.5	9.6**	451.7	594.2	40.3	288.4	40.3	1.000101
31500.0	295.3	-41.4	-64.2	6.7**	444.0	592.7	40.8	288.5	40.8	1.000099
32000.0	288.8	-42.6	-69.3	3.7**	436.4	591.3	41.3	289.1	41.3	1.000097
32500.0	282.4	-43.7	-70.9	0.7**	429.0	589.8	41.5	292.2	41.5	1.000096
33000.0	276.1	-44.2	0.	-0. **	420.2	587.2	41.2	297.7	41.2	1.000094

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA  
0731003902  
WHITE SANDS SITE

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 848

1230 HRS MDT

WSTM SITE COORDINATES  
408580.00FEET E  
185045.00FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES CENTIGRADE	DEWPOINT CENTIGRADE			KNOTS	KNOTS			
33500.0	270.0	-44.4	0.	-0. **	411.1	589.0	303.3	41.8	1.000092	
34000.0	263.9	-44.6	0.	-0. **	402.3	588.7	309.1	43.6	1.000090	
34500.0	258.0	-44.8	0.	-0. **	393.6	588.4	313.7	45.1	1.000088	
35000.0	252.2	-45.0	0.	-0. **	385.1	588.2	315.6	46.1	1.000086	
35500.0	246.5	-45.6	0.	-0. **	377.3	587.4	315.5	46.4	1.000084	
36000.0	240.9	-46.1	0.	-0. **	369.7	586.7	309.5	45.2	1.000082	
36500.0	235.4	-46.7	0.	-0. **	362.2	585.9	303.1	43.9	1.000081	
37000.0	230.1	-47.3	0.	-0. **	354.9	585.2	293.9	42.3	1.000079	
37500.0	224.8	-47.9	0.	-0. **	347.7	584.4	284.8	40.6	1.000077	
38000.0	219.7	-48.5	0.	-0. **	340.7	583.7	277.2	40.7	1.000076	
38500.0	214.7	-49.1	0.	-0. **	333.8	582.9	269.7	41.0	1.000074	
39000.0	209.8	-49.6	0.	-0. **	327.1	582.1	266.2	41.1	1.000073	
39500.0	205.1	-50.0	0.	-0. **	320.2	581.7	264.1	41.1	1.000071	
40000.0	200.4	-50.0	0.	-0. **	312.8	581.7	266.1	41.2	1.000070	
40500.0	195.7	-52.8	0.	-0. **	309.4	578.1	271.2	41.4	1.000069	
41000.0	191.2	-53.4	0.	-0. **	303.1	577.2	276.3	41.6	1.000068	
41500.0	186.7	-53.6	0.	-0. **	296.4	576.9	281.4	41.9	1.000066	
42000.0	182.4	-53.9	0.	-0. **	289.8	576.6	286.4	42.2	1.000065	
42500.0	178.1	-54.1	0.	-0. **	283.3	576.2	291.7	42.0	1.000063	
43000.0	173.9	-54.4	0.	-0. **	277.0	575.9	297.1	41.9	1.000062	
43500.0	169.8	-55.0	0.	-0. **	271.2	575.2	299.9	40.3	1.000060	
44000.0	165.8	-55.8	0.	-0. **	265.7	574.0	302.0	38.5	1.000059	
44500.0	161.8	-56.7	0.	-0. **	260.4	572.9	302.1	36.5	1.000058	
45000.0	157.9	-57.5	0.	-0. **	255.2	571.8	300.6	34.4	1.000057	
45500.0	154.2	-58.4	0.	-0. **	250.1	570.6	296.5	32.7	1.000056	
46000.0	150.5	-59.3	0.	-0. **	245.1	569.5	288.9	31.7	1.000055	
46500.0	146.9	-60.1	0.	-0. **	240.2	568.3	281.6	30.8	1.000053	
47000.0	143.4	-61.0	0.	-0. **	235.5	567.2	276.5	31.3	1.000052	
47500.0	140.0	-61.9	0.	-0. **	230.8	566.0	271.5	31.8	1.000051	
48000.0	136.6	-62.7	0.	-0. **	226.2	564.9	269.3	32.1	1.000050	

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.



STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 848

UPPER AIR DATA  
0731003902  
WHITE SANDS SITE

WIND DIRECTION  
489580.00FEET E  
185045.00FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES(TN)	SPEED KNOTS	
48500.0	133.3	-53.3	0.	-0.	221.4	564.0	269.7	32.1	1.000049
49000.0	130.1	-63.1	0.	-0.	215.8	564.4	270.2	32.1	1.000048
49500.0	126.9	-62.8	0.	-0.	210.2	564.7	273.7	30.5	1.000047
50000.0	123.8	-62.5	0.	-0.	204.9	565.1	277.2	28.9	1.000046
50500.0	120.8	-62.3	0.	-0.	199.6	565.5	282.4	26.5	1.000044
51000.0	117.9	-62.0	0.	-0.	194.6	565.7	288.4	23.8	1.000043
51500.0	115.0	-63.3	0.	-0.	191.0	564.0	286.4	22.5	1.000043
52000.0	112.2	-64.6	0.	-0.	187.4	562.3	272.1	23.6	1.000042
52500.0	109.4	-65.8	0.	-0.	183.9	560.6	258.1	24.6	1.000041
53000.0	106.8	-66.8	0.	-0.	180.3	559.3	256.8	24.0	1.000040
53500.0	104.1	-65.0	0.	-0.	174.3	561.3	255.5	23.3	1.000039
54000.0	101.6	-67.4	0.	-0.	171.9	558.6	253.5	24.0	1.000038
54500.0	99.0	-67.1	0.	-0.	167.5	558.9	250.7	25.8	1.000037
55000.0	96.6	-66.8	0.	-0.	163.1	559.3	248.0	27.7	1.000036
55500.0	94.2	-66.6	0.	-0.	158.9	559.6	254.2	22.9	1.000035
56000.0	91.9	-66.3	0.	-0.	154.8	560.0	260.4	18.1	1.000034
56500.0	89.6	-66.1	0.	-0.	150.8	560.3	263.0	15.2	1.000034
57000.0	87.4	-65.8	0.	-0.	146.9	560.7	259.9	15.2	1.000033
57500.0	85.2	-65.6	0.	-0.	143.1	561.0	256.8	15.1	1.000032
58000.0	83.1	-63.9	0.	-0.	138.5	563.2	251.7	14.9	1.000031
58500.0	81.1	-62.0	0.	-0.	133.9	565.8	245.8	14.7	1.000030
59000.0	79.2	-62.0	0.	-0.	130.6	565.8	239.9	14.5	1.000029
59500.0	77.2	-62.0	0.	-0.	127.5	565.8	242.5	14.4	1.000028
60000.0	75.4	-61.2	0.	-0.	123.9	566.9	245.2	14.2	1.000028
60500.0	73.6	-60.3	0.	-0.	120.4	568.1	246.7	13.6	1.000027
61000.0	71.8	-59.3	0.	-0.	117.0	569.4	244.0	11.6	1.000026
61500.0	70.1	-58.4	0.	-0.	113.7	570.6	241.3	9.6	1.000025
62000.0	68.4	-57.8	0.	-0.	110.7	571.5	241.4	7.9	1.000025
62500.0	66.8	-57.7	0.	-0.	108.0	571.6	244.5	6.4	1.000024
63000.0	65.2	-57.6	0.	-0.	105.4	571.7	247.6	4.9	1.000023

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68 1230 HRS MDT  
ASCENSION NO. 848

UPPER AIR DATA  
0731003902  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES CENTIGRADE	DEWPOINT CENTIGRADE				DIRECTION DEGREES(TN)	SPEED KNOTS	
63500.0	63.7	-57.5	0.	-0. **	102.9	571.8	241.7	4.8	1.000023
64000.0	62.2	-57.4	0.	-0. **	100.4	572.0	232.0	5.4	1.000022
64500.0	60.7	-57.3	0.	-0. **	98.0	572.1	222.3	5.9	1.000022
65000.0	59.3	-57.2	0.	-0. **	95.6	572.2	225.5	7.0	1.000021
65500.0	57.9	-57.1	0.	-0. **	93.3	572.3	230.5	8.1	1.000021
66000.0	56.5	-57.0	0.	-0. **	91.1	572.5	235.5	9.3	1.000020
66500.0	55.2	-56.9	0.	-0. **	88.9	572.6	236.9	8.8	1.000020
67000.0	53.9	-56.8	0.	-0. **	86.8	572.7	236.8	7.8	1.000019
67500.0	52.6	-56.7	0.	-0. **	84.7	572.9	236.8	6.8	1.000019
68000.0	51.4	-56.6	0.	-0. **	82.6	573.0	238.2	6.0	1.000018
68500.0	50.1	-56.5	0.	-0. **	80.7	573.1	243.7	5.8	1.000018
69000.0	49.0	-56.4	0.	-0. **	78.7	573.2	249.2	5.7	1.000018
69500.0	47.8	-56.3	0.	-0. **	76.8	573.4	254.8	5.5	1.000017
70000.0	46.7	-56.2	0.	-0. **	75.0	573.5	253.7	4.6	1.000017
70500.0	45.6	-56.1	0.	-0. **	73.2	573.6	251.0	3.4	1.000016
71000.0	44.5	-56.0	0.	-0. **	71.4	573.7	248.3	2.2	1.000016
71500.0	43.4	-55.9	0.	-0. **	69.7	573.9	247.3	1.8	1.000016
72000.0	42.4	-55.7	0.	-0. **	68.0	574.2	249.7	3.0	1.000015
72500.0	41.4	-55.4	0.	-0. **	66.3	574.6	252.1	4.1	1.000015
73000.0	40.5	-55.1	0.	-0. **	64.7	575.0	254.5	5.3	1.000014
73500.0	39.5	-54.8	0.	-0. **	63.1	575.4	208.7	4.7	1.000014
74000.0	38.6	-54.5	0.	-0. **	61.5	575.8	158.7	4.1	1.000014
74500.0	37.7	-54.2	0.	-0. **	60.0	576.2	108.7	3.4	1.000013
75000.0	36.8	-53.9	0.	-0. **	58.5	576.6	87.2	3.4	1.000013
75500.0	36.0	-53.6	0.	-0. **	57.1	577.0	86.4	2.7	1.000013
76000.0	35.2	-53.3	0.	-0. **	55.7	577.4	81.5	3.9	1.000012
76500.0	34.3	-53.0	0.	-0. **	54.3	577.8	80.7	4.8	1.000012
77000.0	33.5	-52.7	0.	-0. **	53.0	578.2	84.3	6.9	1.000012
77500.0	32.8	-52.3	0.	-0. **	51.7	578.6	87.8	9.0	1.000012
78000.0	32.0	-52.0	0.	-0. **	50.4	579.0	91.4	10.9	1.000011

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 17 OCT. 68  
 ASCENSION NO. 848  
 UPPER AIR DATA  
 0731003902  
 WHITE SANDS SITE  
 WSTM SITE COORDINATES  
 488580.00FEET E  
 185045.00FEET N  
 TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
78500.0	31.3	-51.7	0.	-0. **	49.2	579.4	95.8	95.8	9.8	1.000011
79000.0	30.5	-51.4	0.	-0. **	48.0	579.8	100.2	100.2	8.6	1.000011
79500.0	29.8	-51.2	0.	-0. **	46.8	580.1	104.6	104.6	7.4	1.000010
80000.0	29.1	-51.3	0.	-0. **	45.7	580.0	112.2	112.2	6.8	1.000010
80500.0	28.5	-51.3	0.	-0. **	44.7	579.9	120.9	120.9	6.3	1.000010
81000.0	27.8	-51.4	0.	-0. **	43.7	579.8	129.6	129.6	5.9	1.000010
81500.0	27.2	-51.5	0.	-0. **	42.7	579.7	132.8	132.8	5.4	1.000010
82000.0	26.6	-51.3	0.	-0. **	41.7	579.9	128.6	128.6	4.8	1.000009
82500.0	26.0	-51.1	0.	-0. **	40.7	580.2	124.5	124.5	4.2	1.000009
83000.0	25.4	-50.9	0.	-0. **	39.8	580.5	120.3	120.3	3.6	1.000009
83500.0	24.8	-50.6	0.	-0. **	38.8	580.8	90.2	90.2	2.8	1.000009
84000.0	24.2	-50.4	0.	-0. **	37.9	581.1	60.1	60.1	2.1	1.000008
84500.0	23.7	-50.2	0.	-0. **	37.0	581.5	29.9	29.9	1.3	1.000008
85000.0	23.2	-49.9	0.	-0. **	36.1	581.8	15.5	15.5	1.3	1.000008
85500.0	22.6	-49.7	0.	-0. **	35.3	582.1	19.7	19.7	2.0	1.000008
86000.0	22.1	-49.5	0.	-0. **	34.5	582.4	24.0	24.0	2.8	1.000008
86500.0	21.6	-49.2	0.	-0. **	33.6	582.7	28.3	28.3	3.6	1.000007
87000.0	21.1	-49.0	0.	-0. **	32.9	583.0	10.5	10.5	3.2	1.000007
87500.0	20.7	-48.8	0.	-0. **	32.1	583.3	350.3	350.3	2.7	1.000007
88000.0	20.2	-48.5	0.	-0. **	31.3	583.6	330.0	330.0	2.1	1.000007
88500.0	19.7	-48.3	0.	-0. **	30.6	583.9	329.9	329.9	2.0	1.000007
89000.0	19.3	-48.1	0.	-0. **	29.9	584.2	8.7	8.7	2.8	1.000007
89500.0	18.9	-47.8	0.	-0. **	29.2	584.5	47.4	47.4	3.6	1.000006
90000.0	18.4	-47.6	0.	-0. **	28.5	584.8	86.2	86.2	4.4	1.000006
90500.0	18.0	-47.4	0.	-0. **	27.8	585.1	97.0	97.0	4.6	1.000006
91000.0	17.6	-47.1	0.	-0. **	27.1	585.4	100.2	100.2	4.5	1.000006
91500.0	17.2	-46.9	0.	-0. **	26.5	585.7	103.4	103.4	4.5	1.000006
92000.0	16.8	-46.7	0.	-0. **	25.9	586.0	106.4	106.4	4.6	1.000006
92500.0	16.4	-46.4	0.	-0. **	25.3	586.3	108.7	108.7	5.1	1.000006
93000.0	16.1	-46.2	0.	-0. **	24.7	586.6	111.0	111.0	5.6	1.000005

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 848

UPPER AIR DATA  
0731003902  
WHITE SANDS SITE

WSTM SITE COORDINATES  
485500.00FEET E  
185045.00FEET N

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TM)	SPEED KNOTS	
93500.0	15.7	-46.0	0.	-0. **	24.1	586.9	1113.3	113.3	6.1	1.000005
94000.0	15.4	-45.7	0.	-0. **	23.5	587.2	1122.0	122.0	6.1	1.000005
94500.0	15.0	-45.5	0.	-0. **	23.0	587.5	1133.9	133.9	6.0	1.000005
95000.0	14.7	-45.3	0.	-0. **	22.4	587.8	1145.8	145.8	5.9	1.000005
95500.0	14.3	-45.0	0.	-0. **	21.9	588.1	1156.6	156.6	5.8	1.000005
96000.0	14.0	-44.8	0.	-0. **	21.4	588.4	1159.4	159.4	6.2	1.000005
96500.0	13.7	-44.6	0.	-0. **	20.9	588.7	1162.1	162.1	6.6	1.000005
97000.0	13.4	-44.3	0.	-0. **	20.4	589.0	1164.9	164.9	7.0	1.000005
97500.0	13.1	-44.1	0.	-0. **	19.9	589.3	1171.0	171.0	7.1	1.000004
98000.0	12.8	-43.8	0.	-0. **	19.4	589.6	1179.8	179.8	7.1	1.000004
98500.0	12.5	-43.6	0.	-0. **	19.0	589.9	1188.6	188.6	7.1	1.000004
99000.0	12.2	-43.4	0.	-0. **	18.5	590.2	1197.4	197.4	7.1	1.000004
99500.0	11.9	-43.1	0.	-0. **	18.1	590.5	1202.9	202.9	7.3	1.000004
100000.0	11.7	-42.9	0.	-0. **	17.7	590.8	1208.4	208.4	7.4	1.000004
100500.0	11.4	-42.7	0.	-0. **	17.3	591.1	1213.8	213.8	7.6	1.000004
101000.0	11.2	-42.4	0.	-0. **	16.9	591.4	1218.2	218.2	8.0	1.000004
101500.0	10.9	-42.4	0.	-0. **	16.5	591.5	221.2	221.2	8.8	1.000004
102000.0	10.7	-42.7	0.	-0. **	16.1	591.1	224.2	224.2	9.6	1.000004
102500.0	10.4	-43.0	0.	-0. **	15.8	590.7	227.2	227.2	10.5	1.000004
103000.0	10.2	-43.4	0.	-0. **	15.5	590.3				1.000003
103500.0	10.0	-43.7	0.	-0. **	15.1	589.9				1.000003
104000.0	9.8	-44.0	0.	-0. **	14.8	589.5				1.000003
104500.0	9.5	-44.0	0.	-0. **	14.5	589.5				1.000003
105000.0	9.3	-43.1	0.	-0. **	14.1	590.5				1.000003
105500.0	9.1	-42.3	0.	-0. **	13.8	591.6				1.000003
106000.0	8.9	-41.5	0.	-0. **	13.4	592.6				1.000003

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

NOT REPRODUCIBLE

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 848

MANDATORY LEVELS  
0731003902  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE VIII

PRESSURE GEOPOTENTIAL		TEMPERATURE		REL. HUM.		WIND DATA	
MILLIBARS	FEET	AIR DEGREES	DEWPOINT CENTIGRADE	PERCENT	DIRECTION DEGREES(TN)	SPEED KNOTS	
850.0	5013.	12.3	-9.6	21.	356.7	9.0	
800.0	6663.	7.3	-11.9	24.	351.3	7.9	
750.0	8389.	3.2	-15.4	24.	299.4	8.9	
700.0	10225.	3.9	-17.8	19.	284.7	19.2	
650.0	12196.	2.3	-20.8	16.	288.3	21.3	
600.0	14308.	-1.9	-23.0	18.	271.7	22.4	
550.0	16551.	-6.4	-25.7	20.	281.1	26.0	
500.0	18973.	-11.3	-28.8	22.	283.7	31.4	
450.0	21596.	-17.2	-33.8	22.	288.5	36.4	
400.0	24456.	-24.0	-40.1	21.	297.3	41.6	
350.0	27605.	-31.7	-47.2	20.	289.1	37.8	
300.0	31112.	-40.6	-61.5	9.**	288.1	40.5	
250.0	35131.	-45.2	0.	-0.**	316.4	46.4	
200.0	39961.	-50.2	0.	-0.**	266.5	41.2	
175.0	42781.	-54.3	0.	-0.**	295.7	41.9	
150.0	45988.	-59.4	0.	-0.**	287.6	31.5	
125.0	49687.	-62.6	0.	-0.**	275.9	29.5	
100.0	54161.	-67.2	0.	-0.**	251.8	25.1	
80.0	58613.	-62.0	0.	-0.**	242.5	14.6	
70.0	61339.	-58.4	0.	-0.**	241.2	9.5	
60.0	64533.	-57.2	0.	-0.**	222.8	6.4	
50.0	68322.	-56.5	0.	-0.**	244.2	5.8	
40.0	72980.	-55.0	0.	-0.**	235.1	5.1	
30.0	79064.	-51.2	0.	-0.**	103.4	7.8	
25.0	82952.	-50.7	0.	-0.**	103.3	3.2	
20.0	87746.	-48.4	0.	-0.**	325.3	2.9	
15.0	94000.	-45.5	0.	-0.**	132.1	6.0	
10.0	102941.	-43.6	0.	-0.**			

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 849

SIGNIFICANT LEVEL DATA  
0731003903  
WHITE SANDS SITE

WSM SITE COORDINATES  
480580.00 FEET E.  
185045.00 FEET N

TABLE IX

PRESSURE	GEOMETRIC	TEMPERATURE	REL. HUM.
MILLIBARS	ALTITUDE	AIR DEWPOINT	PERCENT
MSL FEET		DEGREES CENTIGRADE	
879.7	3989.0	19.3	-5.6
861.0	4589.9	15.0	-6.0
732.0	9011.9	4.6	-11.3
699.0	10248.2	5.9	-20.5
688.0	10675.3	7.0	-20.5
550.0	16570.5	-6.3	-25.7
517.0	18152.9	-9.1	-22.5
409.0	23981.0	-20.9	-35.9
364.0	26773.5	-28.2	-42.2
320.0	29766.1	-36.1	-49.9
278.0	32930.7	-43.6	0.
246.0	35634.7	-44.1	0.
192.0	40997.9	-53.5	0.
174.0	43079.9	-54.5	0.
137.0	48029.8	-62.8	0.
119.0	50870.8	-65.8	0.
112.0	52091.2	-63.7	0.
99.0	54558.2	-68.6	0.
60.0	64691.5	-58.9	0.
20.0	88011.0	-48.5	0.
11.5	100091.8	-47.4	0.
7.7	109041.8	-39.1	0.

\*\* RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 849

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE X

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DIRECTION DEGREES (T)	WIND DATA SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE						
3989.0	879.7	19.3	-5.6	18.0	1046.2	666.5	360.0	5.1	1.000251
4000.0	879.4	19.2	-5.6	18.1	1046.1	666.4	0.2	5.1	1.000251
4500.0	863.8	15.6	-5.9	22.3	1040.3	662.3	7.5	5.2	1.000250
5000.0	848.1	14.0	-6.4	23.7	1027.3	660.4	14.8	5.4	1.000246
5500.0	832.7	12.8	-6.9	24.6	1012.9	659.0	22.1	5.6	1.000243
6000.0	817.6	11.6	-7.5	25.6	998.7	657.6	29.4	5.7	1.000239
6500.0	802.7	10.4	-8.1	26.5	984.7	656.2	36.7	5.9	1.000235
7000.0	788.1	9.2	-8.7	27.4	970.9	654.8	28.9	4.5	1.000231
7500.0	773.8	8.0	-9.3	28.3	957.4	653.4	18.2	2.9	1.000228
8000.0	759.7	6.8	-9.9	29.2	944.1	652.0	347.9	3.7	1.000224
8500.0	745.9	5.6	-10.6	30.1	930.9	650.6	300.6	6.6	1.000221
9000.0	732.3	4.4	-11.3	31.0	918.0	649.2	279.8	10.4	1.000217
9500.0	718.8	5.0	-14.0	23.9	899.4	649.7	279.5	15.0	1.000211
10000.0	705.5	5.6	-17.9	16.6	881.1	650.4	285.7	16.1	1.000204
10500.0	692.5	6.5	-20.5	12.4	862.1	651.4	293.5	16.2	1.000198
11000.0	679.6	6.3	-20.7	12.4	846.8	651.1	303.3	15.2	1.000194
11500.0	666.8	5.1	-21.0	13.1	834.3	649.8	309.6	14.4	1.000191
12000.0	654.2	4.0	-21.3	13.8	821.9	648.5	314.6	13.5	1.000189
12500.0	641.9	2.9	-21.7	14.5	809.8	647.1	310.7	13.8	1.000186
13000.0	629.9	1.8	-22.1	15.2	797.8	645.8	305.6	14.4	1.000183
13500.0	618.0	0.6	-22.5	15.8	786.0	644.5	295.9	15.8	1.000180
14000.0	606.4	-0.5	-23.0	16.5	774.4	643.1	287.5	17.6	1.000177
14500.0	595.0	-1.6	-23.4	17.2	763.0	641.8	281.7	20.2	1.000175
15000.0	583.8	-2.8	-23.9	17.9	751.8	640.5	278.2	22.7	1.000172
15500.0	572.8	-3.9	-24.5	18.5	740.8	639.1	277.4	25.1	1.000169
16000.0	562.0	-5.0	-25.0	19.2	729.9	637.8	276.9	26.8	1.000167
16500.0	551.5	-6.1	-25.6	19.9	719.2	636.4	276.6	28.1	1.000164
17000.0	540.8	-7.1	-24.5	23.5	707.8	635.4	278.5	29.2	1.000162
17500.0	530.4	-7.9	-23.5	27.6	696.3	634.3	280.8	30.1	1.000160
18000.0	520.1	-8.8	-22.7	31.7	685.1	633.3	282.4	31.2	1.000158

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68 1500 HRS MDT  
ASCENSION NO. 849

WSTM SITE COORDINATES  
483580.00FEET E  
185045.00FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE						
18500.0	509.8	-9.8	-23.3	32.5	674.1	632.1	284.3	32.4	1.000155
19000.0	499.7	-10.8	-24.4	31.8	653.2	630.9	287.3	34.3	1.000152
19500.0	489.7	-11.8	-25.6	31.2	652.6	629.6	289.9	36.0	1.000150
20000.0	480.0	-12.8	-26.7	30.5	642.1	628.4	292.1	37.5	1.000147
20500.0	470.4	-13.9	-27.9	29.8	631.8	627.2	294.9	38.9	1.000144
21000.0	461.1	-14.9	-29.0	29.1	621.7	625.9	297.9	40.4	1.000142
21500.0	451.9	-15.9	-30.2	28.4	611.7	624.7	300.1	41.8	1.000139
22000.0	442.9	-16.9	-31.3	27.7	602.0	623.4	302.2	43.3	1.000137
22500.0	434.1	-17.9	-32.4	27.0	592.3	622.2	302.7	43.6	1.000134
23000.0	425.5	-18.9	-33.6	26.3	582.9	621.0	303.0	43.8	1.000132
23500.0	417.0	-19.9	-34.8	25.7	573.6	619.7	301.2	43.5	1.000130
24000.0	408.7	-20.9	-35.9	25.0	564.4	618.4	299.2	43.1	1.000127
24500.0	400.2	-22.3	-37.0	25.0	555.7	616.8	296.6	42.1	1.000125
25000.0	392.0	-23.6	-38.2	25.0	547.1	615.2	294.1	42.0	1.000123
25500.0	383.9	-24.9	-39.3	25.0	538.6	613.6	291.7	43.0	1.000121
26000.0	375.9	-26.2	-40.5	25.0	530.3	612.0	289.3	43.5	1.000119
26500.0	368.2	-27.5	-41.6	25.0	522.1	610.3	287.1	43.5	1.000117
27000.0	360.5	-28.8	-42.8	24.8	513.9	608.7	285.9	42.7	1.000115
27500.0	352.8	-30.1	-44.1	24.5	505.7	607.1	285.9	41.4	1.000113
28000.0	345.3	-31.4	-45.4	24.2	497.6	605.4	287.6	39.2	1.000112
28500.0	337.9	-32.8	-46.7	23.8	489.7	603.7	292.5	40.1	1.000110
29000.0	330.7	-34.1	-47.9	23.5	482.0	602.1	298.0	40.7	1.000108
29500.0	323.7	-35.4	-49.2	23.2	474.3	600.4	304.2	40.5	1.000106
30000.0	316.7	-36.7	-51.0	21.3**	466.5	598.8	308.8	41.8	1.000104
30500.0	309.7	-37.8	-53.0	17.7**	458.6	597.3	312.9	42.5	1.000102
31000.0	302.9	-39.0	-56.5	14.0**	450.8	595.8	316.0	44.7	1.000101
31500.0	296.3	-40.2	-59.9	10.4**	443.1	594.3	317.9	46.4	1.000099
32000.0	289.7	-41.4	-64.1	6.8**	435.6	592.8	318.1	48.7	1.000097
32500.0	283.4	-42.6	-70.4	3.1**	428.2	591.3	318.4	50.7	1.000095
33000.0	277.1	-43.6	0.	-0.4**	420.7	589.9	319.1	51.8	1.000094

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.



NOT REPRODUCIBLE

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 849

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTN SITE COORDINATES  
498980.00 FEET E  
185045.00 FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOWS	KNOWS			
33500.0	270.9	-43.7	0.	-0.	411.4	589.8	519.7	319.7	52.6	1.000092
34000.0	264.9	-43.8	0.	-0.	402.4	589.7	320.6	320.6	51.1	1.000090
34500.0	259.0	-43.9	0.	-0.	393.5	589.6	320.5	320.5	49.3	1.000088
35000.0	253.2	-44.0	0.	-0.	384.9	589.5	317.0	317.0	46.5	1.000086
35500.0	247.5	-44.1	0.	-0.	376.4	589.3	313.7	313.7	43.7	1.000084
36000.0	241.9	-44.7	0.	-0.	369.0	588.5	310.8	310.8	41.3	1.000082
36500.0	236.4	-45.6	0.	-0.	361.9	587.3	305.8	305.8	39.6	1.000081
37000.0	231.0	-46.5	0.	-0.	355.0	586.2	296.3	296.3	39.1	1.000079
37500.0	225.7	-47.4	0.	-0.	348.3	585.1	288.1	288.1	39.1	1.000078
38000.0	220.5	-48.2	0.	-0.	341.6	583.9	282.9	282.9	39.9	1.000076
38500.0	215.5	-49.1	0.	-0.	335.1	582.8	277.7	277.7	40.9	1.000075
39000.0	210.6	-50.0	0.	-0.	328.8	581.7	272.6	272.6	43.0	1.000073
39500.0	205.8	-50.9	0.	-0.	322.5	580.5	267.5	267.5	45.2	1.000072
40000.0	201.1	-51.8	0.	-0.	316.4	579.4	267.9	267.9	45.3	1.000070
40500.0	196.5	-52.6	0.	-0.	310.4	578.2	269.9	269.9	44.7	1.000069
41000.0	192.0	-53.5	0.	-0.	304.5	577.1	273.5	273.5	43.8	1.000068
41500.0	187.5	-53.7	0.	-0.	297.7	576.8	278.9	278.9	42.6	1.000066
42000.0	183.1	-54.0	0.	-0.	291.1	576.4	284.2	284.2	41.6	1.000065
42500.0	178.8	-54.2	0.	-0.	284.6	576.1	289.4	289.4	41.2	1.000063
43000.0	174.7	-54.5	0.	-0.	278.3	575.8	293.9	293.9	40.8	1.000062
43500.0	170.5	-55.2	0.	-0.	272.6	574.8	295.2	295.2	40.7	1.000061
44000.0	166.4	-56.0	0.	-0.	257.1	573.7	296.5	296.5	40.6	1.000059
44500.0	162.5	-56.9	0.	-0.	251.7	572.6	298.7	298.7	40.2	1.000058
45000.0	158.6	-57.7	0.	-0.	256.5	571.5	294.7	294.7	39.7	1.000057
45500.0	154.8	-58.6	0.	-0.	251.3	570.4	292.2	292.2	38.6	1.000056
46000.0	151.1	-59.4	0.	-0.	246.3	569.3	287.9	287.9	36.8	1.000055
46500.0	147.5	-60.2	0.	-0.	241.4	568.2	283.2	283.2	35.1	1.000054
47000.0	144.0	-61.1	0.	-0.	236.6	567.0	276.3	276.3	33.2	1.000053
47500.0	140.6	-61.9	0.	-0.	231.8	565.9	269.4	269.4	31.4	1.000052
48000.0	137.2	-62.7	0.	-0.	227.2	564.8	265.3	265.3	32.4	1.000051

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68 1500 HRS MDT  
ASCENSION NO. 849

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTN SITE COORDINATES  
48580.00FEET E  
185045.00FEET N

TABLR X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN) SPEED KNOTS	INDEX OF REFRACTION
48500.0	133.8	-63.3	-0.0	222.2	564.1	261.3	1.000049
49000.0	130.6	-63.8	-0.0	217.3	563.4	262.0	1.000048
49500.0	127.4	-64.4	-0.0	212.5	562.6	264.8	1.000047
50000.0	124.3	-64.9	-0.0	207.9	561.9	267.9	1.000046
50500.0	121.2	-65.4	-0.0	203.3	561.2	271.5	1.000045
51000.0	118.2	-65.6	-0.0	198.5	561.0	274.9	1.000044
51500.0	115.3	-64.7	-0.0	192.8	562.2	275.6	1.000043
52000.0	112.5	-63.9	-0.0	187.3	563.3	276.2	1.000042
52500.0	109.7	-64.5	-0.0	183.2	562.4	274.4	1.000041
53000.0	107.0	-65.5	-0.0	179.6	561.1	271.7	1.000040
53500.0	104.4	-66.5	-0.0	176.0	559.7	270.4	1.000039
54000.0	101.8	-67.5	-0.0	172.5	558.4	271.2	1.000038
54500.0	99.3	-68.5	-0.0	169.0	557.1	272.0	1.000038
55000.0	96.9	-68.2	-0.0	164.6	557.5	271.7	1.000037
55500.0	94.5	-67.7	-0.0	160.3	558.1	271.4	1.000036
56000.0	92.2	-67.2	-0.0	156.0	558.8	270.7	1.000035
56500.0	89.9	-66.7	-0.0	151.8	559.4	269.0	1.000034
57000.0	87.7	-66.3	-0.0	147.8	560.1	267.3	1.000033
57500.0	85.6	-65.8	-0.0	143.8	560.7	263.6	1.000032
58000.0	83.5	-65.3	-0.0	140.0	561.4	258.0	1.000031
58500.0	81.5	-64.8	-0.0	136.3	562.0	252.4	1.000030
59000.0	79.5	-64.3	-0.0	132.6	562.7	250.8	1.000030
59500.0	77.5	-63.9	-0.0	129.1	563.3	249.4	1.000029
60000.0	75.7	-63.4	-0.0	125.7	563.9	245.7	1.000028
60500.0	73.8	-62.9	-0.0	122.3	564.6	241.1	1.000027
61000.0	72.0	-62.4	-0.0	119.1	565.2	241.5	1.000027
61500.0	70.3	-62.0	-0.0	115.9	565.9	245.1	1.000026
62000.0	68.5	-61.5	-0.0	112.8	566.5	248.7	1.000025
62500.0	66.9	-61.0	-0.0	109.8	567.1	252.5	1.000024
63000.0	65.2	-60.5	-0.0	106.9	567.8	256.3	1.000024

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 849

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTM SITE COORDINATES  
485580.00FEET E  
185045.00FEET N

TABLR X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TM)	SPEED KNOTS	INDEX OF REFRACTION
63500.0	63.6	-60.0	-0. **	104.0	568.4	266.3	3.8	1.000023
64000.0	62.1	-59.6	-0. **	101.3	569.1	276.4	5.9	1.000023
64500.0	60.6	-59.1	-0. **	98.6	569.7	279.3	7.7	1.000022
65000.0	59.1	-58.8	-0. **	96.1	570.1	272.0	9.3	1.000021
65500.0	57.8	-58.5	-0. **	93.8	570.4	264.8	10.8	1.000021
66000.0	56.4	-58.3	-0. **	91.5	570.7	263.4	9.8	1.000020
66500.0	55.1	-58.1	-0. **	89.3	571.0	263.6	8.2	1.000020
67000.0	53.8	-57.9	-0. **	87.1	571.3	264.8	6.6	1.000019
67500.0	52.6	-57.6	-0. **	85.0	571.6	274.7	4.9	1.000019
68000.0	51.3	-57.4	-0. **	82.8	571.9	284.5	3.2	1.000018
68500.0	50.1	-57.2	-0. **	80.8	572.2	309.4	2.7	1.000018
69000.0	49.0	-57.0	-0. **	78.9	572.5	356.9	3.8	1.000018
69500.0	47.8	-56.8	-0. **	77.0	572.8	44.4	4.9	1.000017
70000.0	46.7	-56.5	-0. **	75.2	573.1	65.1	5.0	1.000017
70500.0	45.6	-56.3	-0. **	73.3	573.4	73.7	4.7	1.000016
71000.0	44.6	-56.1	-0. **	71.5	573.7	82.2	4.3	1.000016
71500.0	43.5	-55.9	-0. **	69.8	574.0	92.6	4.8	1.000016
72000.0	42.5	-55.6	-0. **	68.1	574.3	103.0	5.3	1.000015
72500.0	41.5	-55.4	-0. **	66.5	574.6	110.4	5.6	1.000015
73000.0	40.6	-55.2	-0. **	64.8	574.9	110.4	5.8	1.000014
73500.0	39.6	-55.0	-0. **	63.3	575.1	110.5	5.9	1.000014
74000.0	38.7	-54.7	-0. **	61.7	575.4	108.9	6.3	1.000014
74500.0	37.8	-54.5	-0. **	60.2	575.7	99.4	6.8	1.000013
75000.0	36.9	-54.3	-0. **	58.8	576.0	93.0	7.2	1.000013
75500.0	36.1	-54.1	-0. **	57.3	576.3	86.9	7.4	1.000013
76000.0	35.2	-53.9	-0. **	56.0	576.6	80.7	7.6	1.000012
76500.0	34.4	-53.6	-0. **	54.6	576.9	83.7	8.6	1.000012
77000.0	33.6	-53.4	-0. **	53.3	577.2	90.0	9.9	1.000012
77500.0	32.8	-53.2	-0. **	52.0	577.5	95.1	10.8	1.000012
78000.0	32.1	-53.0	-0. **	50.7	577.8	96.2	9.9	1.000011

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68 1500 HRS MDT  
ASCENSION NO. 849

JPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES CENTIGRADE	DEWPOINT CENTIGRADE			KNOTS	SC/IND KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
78500.0	31.3	-52.7	0.	-0. **	49.5	578.1	97.3	97.3	9.0	1.000011
79000.0	30.6	-52.5	0.	-0. **	48.3	578.4	103.9	103.9	8.0	1.000011
79500.0	29.9	-52.3	0.	-0. **	47.1	578.7	112.5	112.5	7.1	1.000010
80000.0	29.2	-52.1	0.	-0. **	46.0	579.0	123.8	123.8	6.0	1.000010
80500.0	28.5	-51.8	0.	-0. **	44.9	579.2	153.3	153.3	4.6	1.000010
81000.0	27.8	-51.6	0.	-0. **	43.8	579.5	182.8	182.8	3.2	1.000010
81500.0	27.2	-51.4	0.	-0. **	42.7	579.8	209.0	209.0	2.0	1.000010
82000.0	26.5	-51.2	0.	-0. **	41.7	580.1	214.5	214.5	2.1	1.000009
82500.0	25.9	-51.0	0.	-0. **	40.7	580.4	220.0	220.0	2.1	1.000009
83000.0	25.3	-50.7	0.	-0. **	39.7	580.7	225.5	225.5	2.2	1.000009
83500.0	24.7	-50.5	0.	-0. **	38.7	581.0	235.4	235.4	2.1	1.000009
84000.0	24.2	-50.3	0.	-0. **	37.8	581.3	245.9	245.9	2.1	1.000008
84500.0	23.6	-50.1	0.	-0. **	36.9	581.6	256.5	256.5	2.0	1.000008
85000.0	23.0	-49.8	0.	-0. **	36.0	581.9	258.1	258.1	2.1	1.000008
85500.0	22.5	-49.6	0.	-0. **	35.1	582.2	253.7	253.7	2.4	1.000008
86000.0	22.0	-49.4	0.	-0. **	34.2	582.4	249.3	249.3	2.7	1.000008
86500.0	21.5	-49.2	0.	-0. **	33.4	582.7	238.8	238.8	2.8	1.000007
87000.0	21.0	-49.0	0.	-0. **	32.6	583.0	216.0	216.0	2.6	1.000007
87500.0	20.5	-48.7	0.	-0. **	31.8	583.3	193.2	193.2	2.4	1.000007
88000.0	20.0	-48.5	0.	-0. **	31.0	583.6	170.5	170.5	2.3	1.000007
88500.0	19.6	-48.5	0.	-0. **	30.3	583.7	152.4	152.4	3.0	1.000007
89000.0	19.1	-48.4	0.	-0. **	29.6	583.7	134.2	134.2	3.7	1.000007
89500.0	18.7	-48.4	0.	-0. **	29.0	583.8	116.1	116.1	4.4	1.000006
90000.0	18.3	-48.3	0.	-0. **	28.3	583.8	108.0	108.0	5.6	1.000006
90500.0	17.8	-48.3	0.	-0. **	27.6	583.9	104.3	104.3	6.9	1.000006
91000.0	17.4	-48.2	0.	-0. **	27.0	584.0	100.6	100.6	8.3	1.000006
91500.0	17.0	-48.2	0.	-0. **	26.4	584.0	99.4	99.4	8.7	1.000006
92000.0	16.7	-48.1	0.	-0. **	25.8	584.1	103.0	103.0	7.4	1.000006
92500.0	16.3	-48.1	0.	-0. **	25.2	584.1	106.7	106.7	6.1	1.000006
93000.0	15.9	-48.0	0.	-0. **	24.6	584.2	110.3	110.3	4.8	1.000005

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68 1500 HRS MDT  
ASCENSION NO. 849

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTM SITE COORDINATES  
48°58'0.00" E  
18°50'45.00" N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES (TN)	SPEED KNOTS	
93500.0	15.6	-48.0	0.	-0. **	24.1	584.3	137.2	4.5	1.000005
94000.0	15.2	-48.0	0.	-0. **	23.5	584.3	164.7	4.3	1.000005
94500.0	14.9	-47.9	0.	-0. **	23.0	584.4	192.3	4.0	1.000005
95000.0	14.5	-47.9	0.	-0. **	22.5	584.4	207.8	4.3	1.000005
95500.0	14.2	-47.8	0.	-0. **	21.9	584.5	213.8	5.0	1.000005
96000.0	13.9	-47.8	0.	-0. **	21.4	584.6	219.9	5.8	1.000005
96500.0	13.6	-47.7	0.	-0. **	21.0	584.6	226.0	6.5	1.000005
97000.0	13.2	-47.7	0.	-0. **	20.5	584.7	221.5	6.9	1.000005
97500.0	12.9	-47.6	0.	-0. **	20.0	584.7	216.9	7.3	1.000004
98000.0	12.7	-47.6	0.	-0. **	19.6	584.8	212.2	7.6	1.000004
98500.0	12.4	-47.5	0.	-0. **	19.1	584.9	208.5	8.1	1.000004
99000.0	12.1	-47.5	0.	-0. **	18.7	584.9	207.0	8.9	1.000004
99500.0	11.8	-47.5	0.	-0. **	18.2	585.0	205.4	9.7	1.000004
100000.0	11.5	-47.4	0.	-0. **	17.8	585.0	203.9	10.5	1.000004
100500.0	11.3	-47.0	0.	-0. **	17.4	585.5	207.7	11.5	1.000004
101000.0	11.0	-46.6	0.	-0. **	17.0	586.1	215.2	12.6	1.000004
101500.0	10.8	-46.1	0.	-0. **	16.6	586.7	222.7	13.8	1.000004
102000.0	10.6	-45.6	0.	-0. **	16.2	587.3	230.2	14.9	1.000004
102500.0	10.3	-45.2	0.	-0. **	15.8	587.9	233.1	16.1	1.000004
103000.0	10.1	-44.7	0.	-0. **	15.4	588.5	235.2	17.3	1.000003
103500.0	9.9	-44.2	0.	-0. **	15.0	589.1	237.4	18.4	1.000003
104000.0	9.7	-43.8	0.	-0. **	14.7	589.7	239.6	19.6	1.000003
104500.0	9.4	-43.3	0.	-0. **	14.3	590.3	243.1	21.2	1.000003
105000.0	9.2	-42.8	0.	-0. **	14.0	590.9	246.6	22.8	1.000003
105500.0	9.0	-42.4	0.	-0. **	13.6	591.5	250.1	24.4	1.000003
106000.0	8.8	-41.9	0.	-0. **	13.3	592.1			1.000003
106500.0	8.6	-41.5	0.	-0. **	13.0	592.7			1.000003
107000.0	8.4	-41.0	0.	-0. **	12.7	593.3			1.000003
107500.0	8.3	-40.5	0.	-0. **	12.4	593.9			1.000003
108000.0	8.1	-40.1	0.	-0. **	12.1	594.5			1.000003

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

NOT REPRODUCIBLE

STATION ALTITUDE 3989.00 FEET MSL  
17 OCT. 68  
ASCENSION NO. 849

UPPER AIR DATA  
0731003903  
WHITE SANDS SITE

WSTM SITE COORDINATES  
488580.00FEET E  
185045.00FEET N

TABLE X (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES CENTIGRADE	DEWPOINT				DIRECTION DEGREES(TN)	SPEED KNOTS	
108500.0	7.9	-39.6	0.	-0. **	11.8	595.1			1.000003
109000.0	7.7	-39.1	0.	-0. **	11.5	595.6			1.000003

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL  
 17 OCT. 68  
 ASCENSION NO. 849

MANDATORY LEVELS  
 0731003903  
 WHITE SANDS SITE

WSTM SITE COORDINATES  
 489580.00FEET E  
 185045.00FEET N

TABLE XI

PRESSURE GEOPOTENTIAL		TEMPERATURE		REL. HUM. PERCENT	WIND DATA	
MILLIBARS	FEET	AIR DEGREES	DEWPOINT CENTIGRADE		DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4945.	14.2	-6.3	24.	14.0	5.4
800.0	6610.	10.2	-8.2	27.	37.1	5.8
750.0	8357.	8.0	-10.4	30.	313.8	5.8
700.0	10204.	5.9	-20.0	14.	288.3	16.5
650.0	12190.	3.6	-21.4	14.	313.3	13.6
600.0	14302.	-1.1	-23.2	17.	283.9	15.2
550.0	16556.	-6.3	-25.7	20.	276.6	23.3
500.0	18982.	-10.8	-24.4	32.	287.3	34.3
450.0	21613.	-16.1	-30.4	28.	300.7	42.2
400.0	24490.	-22.3	-37.1	25.	296.5	42.1
350.0	27656.	-30.6	-44.6	24.	286.5	40.5
300.0	31181.	-39.5	-57.9	12.**	317.5	45.3
250.0	35215.	-44.0	0.	-0.**	315.1	44.9
200.0	40049.	-52.0	0.	-0.**	268.4	45.1
175.0	42866.	-54.4	0.	-0.**	293.8	40.9
150.0	46069.	-59.7	0.	-0.**	286.4	36.2
125.0	49759.	-64.8	0.	-0.**	267.0	35.0
100.0	54213.	-68.2	0.	-0.**	271.8	31.8
80.0	58641.	-64.5	0.	-0.**	251.3	18.6
70.0	61336.	-61.9	0.	-0.**	245.2	8.3
60.0	64488.	-58.9	0.	-0.**	276.6	8.3
50.0	68257.	-57.2	0.	-0.**	307.5	2.6
40.0	72911.	-55.1	0.	-0.**	110.5	5.8
30.0	78977.	-52.3	0.	-0.**	108.7	7.5
25.0	82861.	-50.6	0.	-0.**	228.9	2.2
20.0	87656.	-48.5	0.	-0.**	169.6	2.3
15.0	93875.	-47.9	0.	-0.**	181.2	4.1
10.0	102684.	-44.5	0.	-0.**	236.1	17.7

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

RELEASE TIME (MDT)		SECOND-STAGE IMPACT DISPLACEMENT IN MILES DUE TO WIND								AZI- MUTH (DEG- REES)	THEORETICAL IMPACT FROM LAUNCHER (IN MILES)				
		15-216 FT				216-4000 FT								TOTAL	
		N-S		E-W		N-S		E-W						N-S	E-W
RAWIN SONDE	PIBAL	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W					RANGE	N-S
1230	1330	4.2N	3.7E	6.7N	4.6E	6.8N	9.3W	17.7N	1.0W	359.2	49.2	49.2N	0.7W		
1230	1400	5.8N	0.6E	6.8N	1.9E	6.8N	9.3W	19.4N	6.8W	352.7	51.3	50.9N	6.5W		
1230	1430	4.0N	4.5E	6.5N	2.2E	6.8N	9.3W	17.3N	2.6W	357.3	48.9	48.8N	2.3W		
1230	1445	4.7N	1.1E	3.8N	3.2E	6.8N	9.3W	15.3N	5.0W	354.3	47.0	46.8N	4.7W		
1230	1500	3.2N	3.9E	3.8N	3.3E	6.8N	9.3W	13.8N	2.1W	357.8	45.3	45.3N	1.8W		
1230	1510	1.5N	3.4E	4.7N	2.5E	6.8N	9.3W	13.0N	3.4W	356.0	44.6	44.5N	3.1W		
1230	1520	2.1N	1.4E	3.9N	4.5E	6.8N	9.3W	12.8N	3.4W	356.0	44.4	44.3N	3.1W		
1230	1531	3.3N	0.6E	4.4N	2.2E	6.8N	9.3W	14.5N	6.5W	352.3	46.4	46.0N	6.2W		
1500	1531	3.3N	0.6E	4.4N	2.2E	7.4N	9.0W	15.1N	6.2W	352.8	47.0	46.6N	5.9W		

LAUNCHER SETTING (ELEVATION 86.4 DEGREES QE)	AZI- MUTH (DEG- REES)	MILES FROM LAUNCHER		
		RANGE	N-S	E-W
NO WIND IMPACT	005.0	31.6	31.5N	2.8E
PREDICTED SECOND-STAGE IMPACT	000.5	31.5	31.5N	0.3E
SECOND-STAGE IMPACT, RADAR TRACK	357.0	44.7	44.6N	2.3W
PREDICTED BOOSTER IMPACT	353.2	42.9	42.6N	5.5W
ACTUAL BOOSTER IMPACT	026.0	1.4	1.3N	0.6E
	N/A	N/A	N/A	N/A

TABLE XII. IMPACT PREDICTION DATA  
NIKE-HYDAC 9.5-68-4-604



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13. ABSTRACT			
<p>Meteorological data gathered for the launching of Nike-Hydac 9.5-68-4-604 are presented for the Defense Atomic Support Agency, Sub-task 905, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.</p>			

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